

REMARKS

Claims 3, 4, and 6 have been previously canceled. Claims 1, 2, 5, and 7 remain in the application.

Claims 1, 2, 5, and 7 were rejected under 35 U.S.C. § 103 as being unpatentable over Longo et al. (U.S. Patent No. 3,723,165). Applicants respectfully traverse this rejection.

As to patentability, 35 U.S.C. § 103 provides that a patent may not be obtained:

If the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Id.

The United States Supreme Court interpreted the standard for 35 U.S.C. § 103 in Graham v. John Deere, 383 U.S. 1, 148 U.S.P.Q. 459 (1966). In Graham, the Court stated that under 35 U.S.C. § 103:

The scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or non-obviousness of the subject matter is determined. 148 U.S.P.Q. at 467.

Using the standard set forth in Graham, the scope and content of the prior art relied upon by the Examiner will be determined.

As to the primary reference applied by the Examiner, U.S. Patent No. 3,723,165 to Longo et al. discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying same. A high temperature plastic powder is flame sprayed in admixture with about 5 – 99 weight percent, and preferably about 40 – 80 weight percent, of a flame spray metal powder by heating the mixture to a temperature sufficient to substantially melt the metal powder and surface heat-soften the high temperature plastic, and propelling the thus

heated particles onto a surface, forming a coating. Examples of these high temperature plastics include the well known polyimide plastics, polyamide-polyimide plastics, polyester imide plastics, and aromatic polyester plastics. Typical metal powders for mixing with the plastic are aluminum alloys, nickel alloys, copper, bronze, babbitt and stainless steels. Longo et al. does not disclose an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer flame of a composite made of a polymer material and the metal material sprayed on the inner layer and having a second predetermined thickness.

In contradistinction, claim 1 claims the present invention as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness.

The United States Court of Appeals for the Federal Circuit (CAFC) has stated in determining the propriety of a rejection under 35 U.S.C. § 103, it is well settled that the obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). The law followed by our court of review and the Board of Patent Appeals and Interferences is that “[a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.” In re Rinehart, 531 F.2d 1048, 1051, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976). See also In re Lalu, 747 F.2d 703, 705,

223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984) (“In determining whether a case of prima facie obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.”)

As to the differences between the prior art and the claims at issue, Longo et al. ‘165 merely discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying. Longo et al. ‘165 lacks an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness. In Longo et al. ‘165, the spraying may be effected on any surface or substrate and sprays a bond coat on the surface to adhere the admixture, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of a metal material and polymer material to form an outer layer. Contrary to the Examiner, column 3, lines 54 through 60, of Longo et al. ‘165 does not state that a metal substrate material can be sprayed on the article to form an inner layer. Column 3, lines 54 through 60, of Longo et al. ‘165 states that:

[s]praying may be effected on any surface or substrate such as carbon steel, stainless steel, aluminum, copper alloys, nickel alloys, cobalt alloys and titanium.

As such, the Examiner has misinterpreted Longo et al. ‘165. Longo et al. ‘165 discloses only two layers being the substrate and a plastic/metal outer layer. In the present invention, there are three distinct layers being the substrate, inner metal layer, and plastic/metal outer layer. Therefore, there is no suggestion or motivation in the art for modifying Longo et al. ‘165. It is well settled that inherency may not be established by probabilities or possibilities, but must instead be “the natural result flowing from the operation as taught.” See In re Oelrich, 666 F.2d 578, 581, 212

U.S.P.Q. 323, 326 (C.C.P.A. 1981). The Examiner is required to find a reference that shows a sprayed metal inner layer on a substrate and sprayed a metal/plastic outer layer on a sprayed metal inner layer.

As to the level of ordinary skill in the pertinent art, Longo et al. '165 merely discloses a mixed metal and high-temperature plastic flame spray powder. However, there is absolutely no teaching of a level of skill in the thermal spraying art of a thermally sprayed article constructed of an article substrate, an inner layer of a metal material thermally sprayed on the article substrate, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer. A rejection based on 35 U.S.C. § 103 must rest on a factual basis, with the facts being interpreted without hindsight reconstruction of the invention from the prior art. In making this evaluation, the Examiner has the initial duty of supplying the factual basis for the rejection he advances. He may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F.2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967). While Longo et al. '165 teaches a mixed metal and high-temperature plastic flame spray powder, Longo et al. '165 does not teach or suggest an inner layer of a metal material thermally sprayed on an article substrate and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer. Thus, none of the references teaches a level of skill in the art of a thermally sprayed article constructed of an article substrate, an inner layer of a metal material thermally sprayed on the article substrate, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer. As such, there is no suggestion or motivation in the art to modify Longo et al. '165.

The present invention sets forth a unique and unobvious thermally sprayed article that decreases the hardness and increases the plasticity and lubricity of the outer layer while the

hardness of the inner layer remains unchanged. Longo et al. '165, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness as claimed by Applicants. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 1 is allowable over the rejection under 35 U.S.C. § 103.

As to claim 2, claim 2 claims the present invention as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness. The second predetermined thickness is less than the first predetermined thickness.

As to the differences between the prior art and the claims at issue, Longo et al. '165 merely discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying. Longo et al. '165 lacks an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness with the second predetermined thickness being less than the first predetermined thickness. In Longo et al. '165, the spraying may be effected on any surface or substrate and sprays a bond coat on the surface to adhere the admixture, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of metal material and polymer material to form an outer layer. Contrary to

the Examiner, column 3, lines 54 through 60, of Longo et al. '165 does not state that a metal substrate material can be sprayed on the article to form an inner layer. Column 3, lines 54 through 60, of Longo et al. '165 states that:

[s]praying may be effected on any surface or substrate such as carbon steel, stainless steel, aluminum, copper alloys, nickel alloys, cobalt alloys and titanium.

As such, the Examiner has misinterpreted Longo et al. '165. There is no suggestion or motivation in the art for modifying Longo et al. '165. The Examiner is required to find a reference that shows spraying a metal inner layer and spraying a metal/plastic outer layer.

As to the level of ordinary skill in the pertinent art, Longo et al. '165 merely discloses a mixed metal and high-temperature plastic flame spray powder. However, there is absolutely no teaching of a level of skill in the thermal spraying art of a thermally sprayed article constructed of an article substrate, an inner layer of a metal material thermally sprayed on the article substrate, and an outer layer of a composite of a polymer material and the metal material flame sprayed on the inner layer.

The present invention sets forth a unique and unobvious thermally sprayed article that decreases the hardness and increases the plasticity and lubricity of the outer layer while the hardness of the inner layer remains unchanged. Longo et al. '165, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness, and an outer layer of a composite of a polymer material and the metal material flame sprayed on the inner layer and having a second predetermined thickness less than the first predetermined thickness as claimed by Applicants.

Further, the CAFC has held that "[t]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the

desirability of the modification”. In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). The Examiner has failed to show how the prior art suggested the desirability of modification to achieve Applicants’ invention. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 2 is allowable over the rejection under 35 U.S.C. § 103.

As to claim 5, claim 5 claims the present invention as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed on the article substrate. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer. The outer layer has a hardness less than the inner layer.

As to the differences between the prior art and the claims at issue, Longo et al. ‘165 merely discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying. Longo et al. ‘165 lacks an inner layer of a metal material thermally sprayed on an article substrate and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and the outer layer having a hardness less than the inner layer. In Longo et al. ‘165, the spraying may be effected on any surface or substrate and sprays a bond coat on the surface to adhere the admixture, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of a polymer material and a metal material to form an the outer layer. Contrary to the Examiner, column 3, lines 54 through 60, of Longo et al. ‘165 does not state that a metal substrate material can be sprayed on the article to form an inner layer. Column 3, lines 54 through 60, of Longo et al. ‘165 states that:

[s]praying may be effected on any surface or substrate such as carbon steel, stainless steel, aluminum, copper alloys, nickel alloys, cobalt alloys and titanium.

As such, the Examiner has misinterpreted Longo et al. '165. There is no suggestion or motivation for modifying Longo et al. '165. The Examiner is required to find a reference that shows a sprayed a metal inner layer and sprayed metal/plastic outer layer with the outer layer having a hardness less than the inner layer.

As to the level of ordinary skill in the pertinent art, Longo et al. '165 merely discloses a mixed metal and high-temperature plastic flame spray powder. However, there is absolutely no teaching of a level of skill in the thermal spraying art of a thermally sprayed article constructed of an article substrate, an inner layer of a metal material thermally sprayed on the article substrate, and an outer layer of a composite of a polymer material and the metal material flame sprayed on the inner layer and the outer layer having a hardness less than the inner layer.

The present invention sets forth a unique and unobvious thermally sprayed article that decreases the hardness and increases the plasticity and lubricity of the outer layer while the hardness of the inner layer remains unchanged. Longo et al. '165, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on the article substrate, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and the outer layer having a hardness less than the inner layer as claimed by Applicants. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 5 is allowable over the rejection under 35 U.S.C. § 103.

As to claim 7, claim 7 claims the present invention as a thermally sprayed article including an article substrate and an inner layer of a metal material thermally sprayed

on the article substrate and having a first predetermined thickness. The thermally sprayed article also includes an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and having a second predetermined thickness less than the first predetermined thickness. The outer layer has a hardness less than the inner layer.

As to the differences between the prior art and the claims at issue, Longo et al. '165 merely discloses a mixed metal and high-temperature plastic flame spray powder and method of flame spraying. Longo et al. '165 lacks an inner layer of a metal material thermally sprayed on an article substrate and having a first predetermined thickness, and an outer layer of a composite made of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and having a second predetermined thickness with the outer layer having a hardness less than the inner layer. In Longo et al. '165, the spraying may be effected on any surface or substrate and sprays a bond coat on the surface to adhere the admixture, but does not thermally spray a metal material against an article substrate to form an inner layer before flame spraying an admixture of a polymer material and a metal material to form an outer layer. Contrary to the Examiner, column 3, lines 54 through 60, of Longo et al. '165 does not state that a metal substrate material can be sprayed on the article to form an inner layer. Column 3, lines 54 through 60, of Longo et al. '165 states that:

[s]praying may be effected on any surface or substrate such as carbon steel, stainless steel, aluminum, copper alloys, nickel alloys, cobalt alloys and titanium.

As such, the Examiner has misinterpreted Longo et al. '165. There is no suggestion or motivation for modifying Longo et al. '165. The Examiner is required to find a

reference that shows a sprayed a metal inner layer and sprayed metal/plastic outer layer with the outer layer having a hardness less than the inner layer. The Examiner may not, because he doubts that the invention is patentable, resort to speculation, unfounded assumptions or hindsight reconstruction to supply deficiencies in the factual basis. See In re Warner, 379 F.2d 1011, 154 U.S.P.Q. 173 (C.C.P.A. 1967).

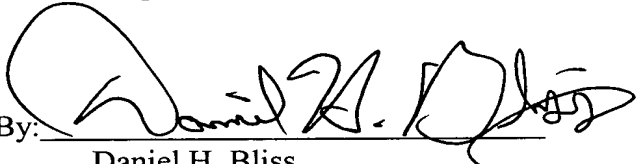
As to the level of ordinary skill in the pertinent art, Longo et al. '165 merely discloses a mixed metal and high-temperature plastic flame spray powder. However, there is absolutely no teaching of a level of skill in the thermal spraying art of a thermally sprayed article constructed of an article substrate, an inner layer of a metal material thermally sprayed on the article substrate, and an outer layer of a composite of a polymer material and the metal material flame sprayed on the inner layer and the outer layer having a thickness less than the inner layer and the outer layer having a hardness less than the inner layer.

The present invention sets forth a unique and unobvious thermally sprayed article decreases the hardness and increases the plasticity and lubricity of the outer layer while the hardness of the inner layer remains unchanged. Longo et al. '165, if modifiable, fails to teach or suggest the combination of a thermally sprayed article including an article substrate, an inner layer of a metal material thermally sprayed on the article substrate and having a first predetermined thickness, and an outer layer of a composite of a polymer material and the metal material flame sprayed on the inner layer with the polymer material and the metal material being co-deposited to form the outer layer and having a second predetermined thickness with the outer layer having a hardness less than the inner layer as claimed by Applicants. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 7 is allowable over the rejection under 35 U.S.C. § 103.

Obviousness under § 103 is a legal conclusion based on factual evidence (In re Fine, 837 F.2d 1071, 1073, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988), and the subjective opinion of the Examiner as to what is or is not obvious, without evidence in support thereof, does not suffice. Since the Examiner has not provided a sufficient factual basis which is supportive of his position (see In re Warner, 379 F.2d 1011, 1017, 154 U.S.P.Q. 173, 178 (C.C.P.A. 1967), cert. denied, 389 U.S. 1057 (1968)), the rejection of claims 1, 2, 5, and 7 is improper. Therefore, it is respectfully submitted that claims 1, 2, 5, and 7 are allowable over the rejection under 35 U.S.C. § 103.

Based on the above, it is respectfully submitted that the claims are in a condition for allowance or in better form for appeal. Applicants respectfully request reconsideration of the claims and withdrawal of the final rejection. It is respectfully requested that this Amendment be entered under 37 C.F.R. 1.116.

Respectfully submitted,

By: 
 Daniel H. Bliss
 Reg. No. 32,398

BLISS McGLYNN, P.C.
 2075 W. Big Beaver Road, Suite 600
 Troy, Michigan 48084
 (248) 649-6090

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